

In the Claims

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(Currently Amended) A polymer-clay nanocomposite comprising:

- (i) a melt-processible matrix polyamide polymer, and incorporated therein
- (ii) a layered clay material having less than 2.0 % by weight of quartz,

based on the weight of the layered clay material, the layered clay material intercalated with an organic cation intercalant and a polyamide oligomer or polymer intercalant selected from the group consisting of poly (m-xylene adipamide); a copolymer thereof; nylon 6; nylon 6,6; and a mixture thereof.

2. Cancelled.

2/

(Previously Amended) The nanocomposite of claim 1, wherein the melt-processible matrix polymer comprises a partially aromatic polyamide, aliphatic polyamide, wholly aromatic polyamide or a mixture thereof.

3/

(Previously Amended) The nanocomposite of claim 1, wherein the melt-processible matrix polymer comprises poly(m-xylene adipamide) or a copolymer thereof, isophthalic acid-modified poly(m-xylene adipamide), nylon-6, nylon-6,6, or a copolymer thereof, EVOH or a mixture thereof.

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(Currently Amended) The nanocomposite of claim 1, comprising greater than zero to about 25 weight percent of the layered clay material.

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(Currently Amended) The nanocomposite of claim 1, comprising from about 0.5 to about 15 weight percent of the layered clay material.

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(Previously Amended) The nanocomposite of claim 1, wherein the layered clay material comprises montmorillonite, hectorite, mica, vermiculite, bentonite, nontronite, beidellite, volkonskoite, saponite, magadite, kenyaite, or a mixture thereof, wherein the layered clay material is optionally treated with an organic cation.

7/

(Previously Amended) The nanocomposite of claim 1, wherein the layered clay material comprises organic cation-treated sodium montmorillonite or organic cation-treated sodium bentonite.

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(Previously Amended) The nanocomposite of claim 1, wherein about 50 percent of the

layered clay material is dispersed in the form of individual platelet particles and tactoids in the matrix polymer and the individual platelet particles have a thickness of less than 2 nm and a diameter of from about 10 to about 3000 nm.

9 10. (Previously Amended) The nanocomposite of claim 1, wherein the layered clay material has less than 1.0 % by weight of quartz particles.

11. Cancelled.

10 12. (Currently Amended) The nanocomposite of claim 11, wherein the organic cation is derived from ammonium salt compound.

11 13. (Previously Amended) The nanocomposite of claim 1, wherein the melt-processible matrix polymer comprises poly(m-xylylene adipamide) or a copolymer thereof, and the clay material comprises sodium montmorillonite or sodium bentonite.

19 14. (Original) An article prepared from the nanocomposite of claim 1.

15. Cancelled.

16. Cancelled.

17. Cancelled.

20 18. (Original) An article having a plurality of layers wherein at least one layer is formed from the nanocomposite of claim 1.

21 19. (Original) The article of claim 18, wherein the nanocomposite is disposed between two other layers.

20. Cancelled.

21. Cancelled.

24 22. (Currently Amended) A process for preparing a polymer-clay nanocomposite comprising the steps of:

(i) forming a concentrate comprising an oligomeric resin and a layered clay material having less than 2.0 % by weight of quartz, based on the weight of the layered clay material, the layered clay material intercalated with an organic cation intercalant and a polyamide oligomer or polymer intercalant selected from the group consisting of poly (m-xylylene adipamide); a copolymer thereof; nylon 6; nylon 6,6; and a mixture thereof, and

(ii) melt mixing the concentrate with a melt-processible matrix polymer to form a

polymer-clay nanocomposite.

23. Cancelled.

24. Cancelled.

25. Cancelled.

26. Cancelled.

27. Cancelled.

28. Cancelled.

29. Cancelled.

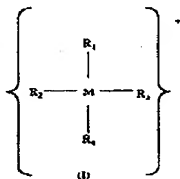
28/ 30. (Currently Amended) A process for reducing haze in an article having a nanocomposite material comprising:

(i) preparing a polymer-clay nanocomposite material comprising the step of mixing a melt-processible matrix polymer and a layered clay material having less than 2.0 % by weight of quartz, based on the weight of the layered clay material, the layered clay material intercalated with an organic cation intercalant and a polyamide oligomer or polymer intercalant selected from the group consisting of poly (m-xylylene adipamide); a copolymer thereof; nylon 6; nylon 6,6; and a mixture thereof, to form a polymer-clay nanocomposite material; and

(ii) molding an article from the nanocomposite material, wherein the article has a haze which is at least 4 percent lower than that of an article formed from a nanocomposite having unpurified clay therein.

12/ 31. (Previously Added) The nanocomposite of claim 1, further comprising an oligomeric resin.

13/ 32. (Currently Amended) The nanocomposite of claim 1, wherein the layered clay material has been treated with an organic cation having the formula:



wherein M is either N nitrogen or phosphorus; and R₁, R₂, R₃, and R₄ are independently organic and/or oligomeric ligands or hydrogen.

14/ 33. (Previously Added) The nanocomposite of claim 1, wherein the layered clay material has been treated with an alkyl or alkoxyated ammonium cation.

22/ 34. (Previously Amended) The article of claim 1, in the form of a film, sheet, pipe, an extruded article, a molded article, a molded container or bottle, wherein the article has a gas permeability which is at least 10 percent lower than that of an article formed from a clay-free polymer.

23/ 35. (Previously Amended) The article of claim 1, in the form of a film, sheet, pipe, an extruded article, a molded article, a molded container or bottle, wherein the article has a haze which is at least 4 percent lower than that of an article formed from a nanocomposites having unpurified clay therein.

31/ 36. (Currently Amended) A process for preparing a polyamide nanocomposite film having decreased haze and decreased oxygen permeability comprising the steps of:

a. intercalating a layered clay material with an organic cation, wherein the layered clay material has less than 2 wt% of quartz, based on the weight of the layered clay material, the layered clay material intercalated with an organic cation intercalant and a polyamide oligomer or polymer intercalant selected from the group consisting of poly (m-xylene adipamide); a copolymer thereof; nylon 6; nylon 6,6; and a mixture thereof;

b. further intercalating the layered clay material with a melt of a polyamide oligomer or polymer intercalant;

c. forming the further intercalated layered clay material into a film; and

d. stretching the film.

32/ 37. (Previously Added) The process of Claim 36 wherein the polyamide oligomer or polymer intercalant comprises poly(m-xylene adipamide).

33/ 38. (Previously Added) The process of Claim 36 further comprising the step of shearing the intercalated clay material.

15/ 39. (Previously Added) The nanocomposite of Claim 31, wherein the polyamide oligomer or

polymer intercalant comprises poly(*m*-xylylene adipamide) or a copolymer thereof, and the clay material comprises sodium montmorillonite or sodium bentonite.

16/ 40. (Previously Amended) The nanocomposite of Claim 10, wherein the layered clay material has less than 0.7% by weight quartz. 19

17/ 41. (Previously Amended) The nanocomposite of Claim 40, wherein the layered clay material has less than 0.5% by weight quartz. 16

25/ 42. (Previously Amended) The process of Claim 22, wherein the layered clay material has less than 0.7% by weight quartz. 24

26/ 43. (Previously Amended) The process of Claim 42, wherein the layered clay material has less than 0.5% by weight quartz. 24

27/ 44. (Currently Amended) The process of Claim 27, wherein the polyamide oligomer or melt processible matrix polyamide polymer comprises poly(*m*-xylylene adipamide), a copolymer thereof, or a mixture thereof. 24

29/ 45. (Currently Amended) The process of Claim 30, wherein the polyamide oligomer or melt processible matrix polyamide polymer comprises poly(*m*-xylylene adipamide), a copolymer thereof, or a mixture thereof. 28

18/ 46. (Previously Added) The nanocomposite of Claim 1, wherein the intercalated clay material functions to decrease the gas permeability and haze of the nanocomposite. 1

47. (Currently Amended) The process of Claim 22 ~~that~~ wherein the intercalated clay material functions to decrease the gas permeability and haze of the nanocomposites. 28

30/ 48. (Currently Amended) The process of Claim 30 ~~that~~ wherein the intercalated clay material functions to decrease the gas permeability and haze of the nanocomposites.